United States Department of Agriculture

Request for an Emergency Situation Determination for 2019 Blowdown Project

Chequamegon-Nicolet National Forest, Lakewood-Laona Ranger District

February 11, 2020

Damage on Highway 32 in Oconto County, WI. This Portal is passed by more visitors annually than any other entrance on the forest.

For More Information Contact:
Project Coordinator
Mathew St Pierre, Natural Resources Staff Officer
500 Hanson Lake Road
Rhinelander, WI 54501
matthew.stpierre@usda.gov
(715) 362-1385

Other contacts:
Marilee Houtler, Environmental Coordinator
Lakewood Laona Ranger District, Chequamegon-Nicolet National Forest
15085 State Rd 32,
Lakewood, WI 54138
marilee.houtler@usda.gov
(715) 276-6333 ext. 4246

Michael Brown, District Ranger
Lakewood-Laona Ranger District, Chequamegon-Nicolet National Forest
15085 State Rd 32,
Lakewood, WI 54138
michael.w.brown@usda.gov
(715) 276-6333

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Introduction

We are proposing to salvage harvest on National Forest System lands on approximately 40,000 acres of the Lakewood-Laona Ranger District of the Chequamegon-Nicolet National Forest (CNNF).

In July 19, 2019, strong winds damaged forested stands across northern Wisconsin with areas of concentrated damage across a swath of the southern half of the Lakewood-Laona Ranger District (Figure 1). Unlike a typical tornado's defined path of damage, the July storm's winds struck randomly, slamming down from towering thunderstorm clouds. Forest Service crews have found wooded acres intact beside heavy damage. Approximately 137,000 acres sustained damage; this is roughly nine percent of the CNNF landbase. Approximately 66,400 acres of forested stands have been characterized as blown down (>50% trees down). Wood decays rapidly in northern Wisconsin forests. To realize the commercial value of the wood, salvage harvest operations are most viable within the first 12 months; after 3-5 years the wood is usable only as firewood, biofuel or pallet stock (Bratkovitch et al 2010, Anderson 2019). The Wisconsin Department of Natural Resources has advised that landowners salvage downed timber before next spring (Spring 2020) to capture the economic value of the material (WDNR 2019).

Large scale blowdown has been the predominant stand-replacing natural process in this ecological region and not fire as in drier areas of the country. However, a large area of this storm damage occurred on the more fire prone pine-dominated forest on sandy, dry soils. The risk of wildfire in the Wildland Urban Interface, threatens private homes and is a situation that must be addressed.

Initial response to clear areas most critical to the health and safety of forest visitors and personnel (e.g. public roads, trails, and recreation sites) was almost completed before the onset of winter; snow-loading on compromised trees is expected to continue to create access blockages. The storm impacted vegetation management actions (i.e. timber sales) that were in various stages of completion; supplemental analyses and reviews of those decisions were completed first. In addition, Forest Service staff and Wisconsin Department of Natural Resources partners (under Good Neighbor Authority) have been adjusting existing timber sale contracts, revising harvest prescriptions, and preparing salvage sale contracts on over 8,400 acres (totaling approximately 75 million board feet). This work will continue through March 2020 after which time the treatment of all remaining blowdown acres will need to be approved under a decision from a new NEPA analyses (largely the EA that is in preparation in conjunction with this ESD proposal). Maintaining a continuous and predictable offering of sales is expected to increase the likelihood that the offerings continue to sell.

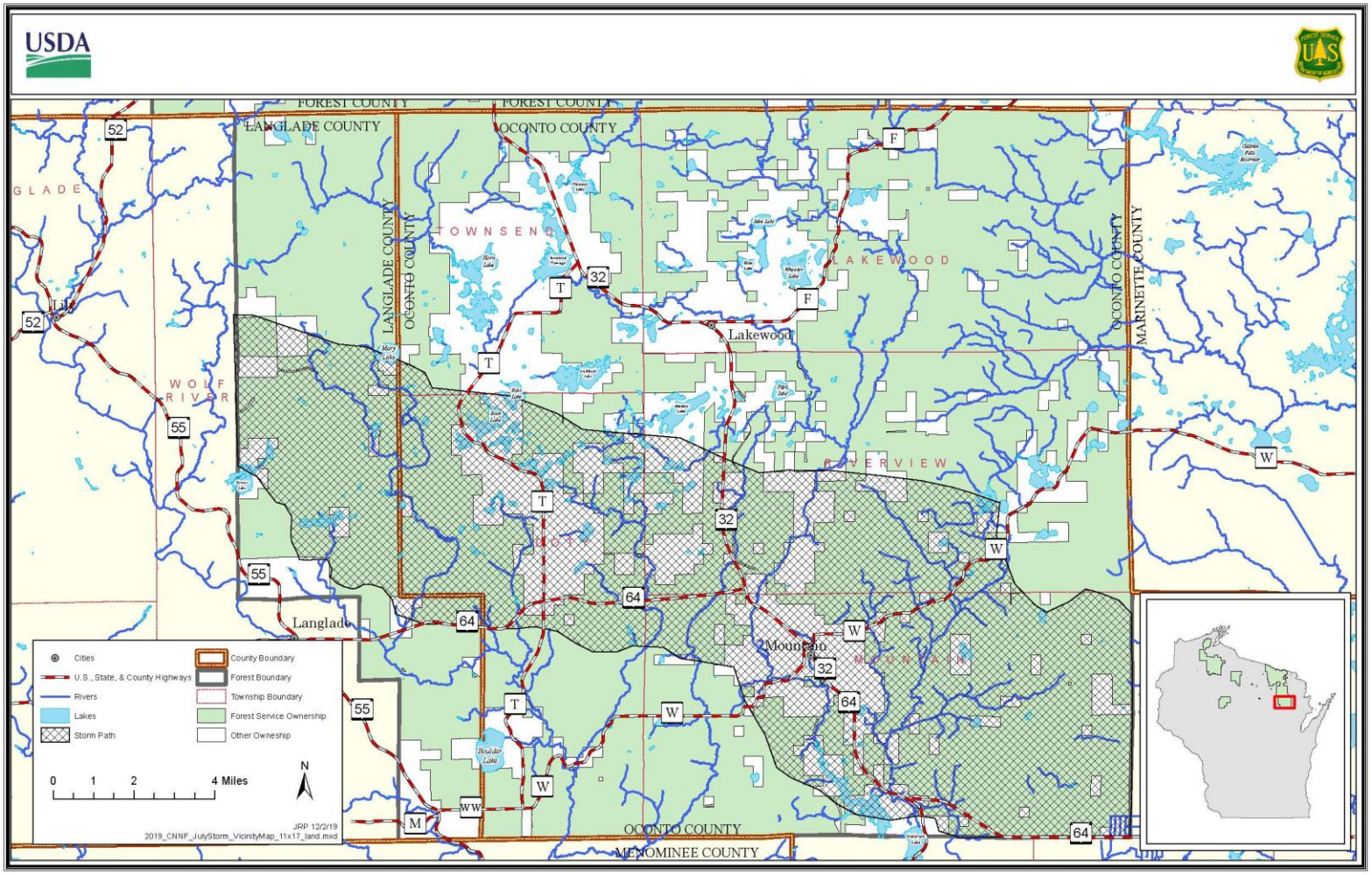

Figure 1. Southern half of Lakewood-Laona Ranger District of Chequamegon-Nicolet showing areas damaged by the massive downdraft *macrobursts*, tornados and derechos.

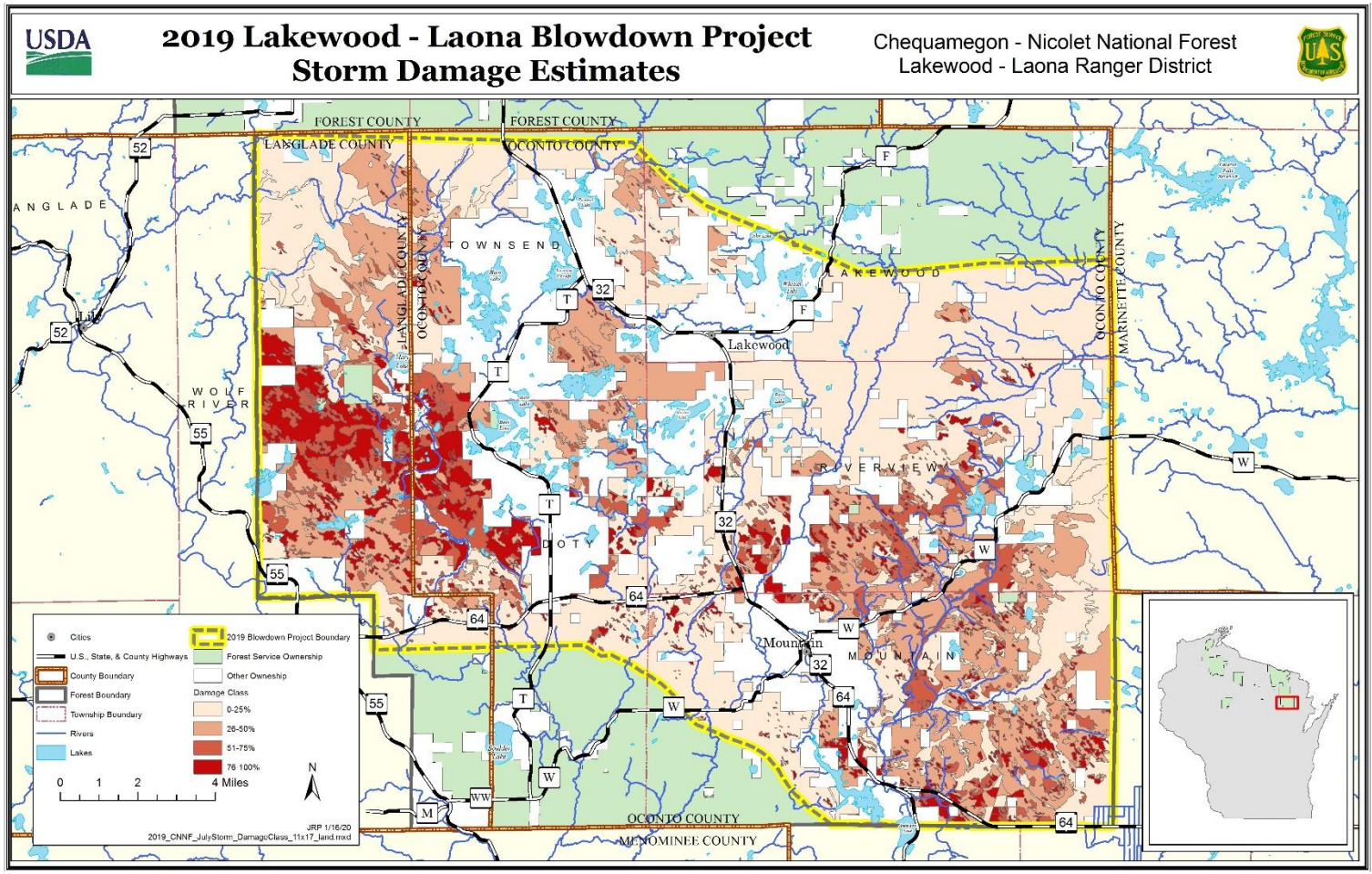

Figure 2. Damage assessment in the project area.

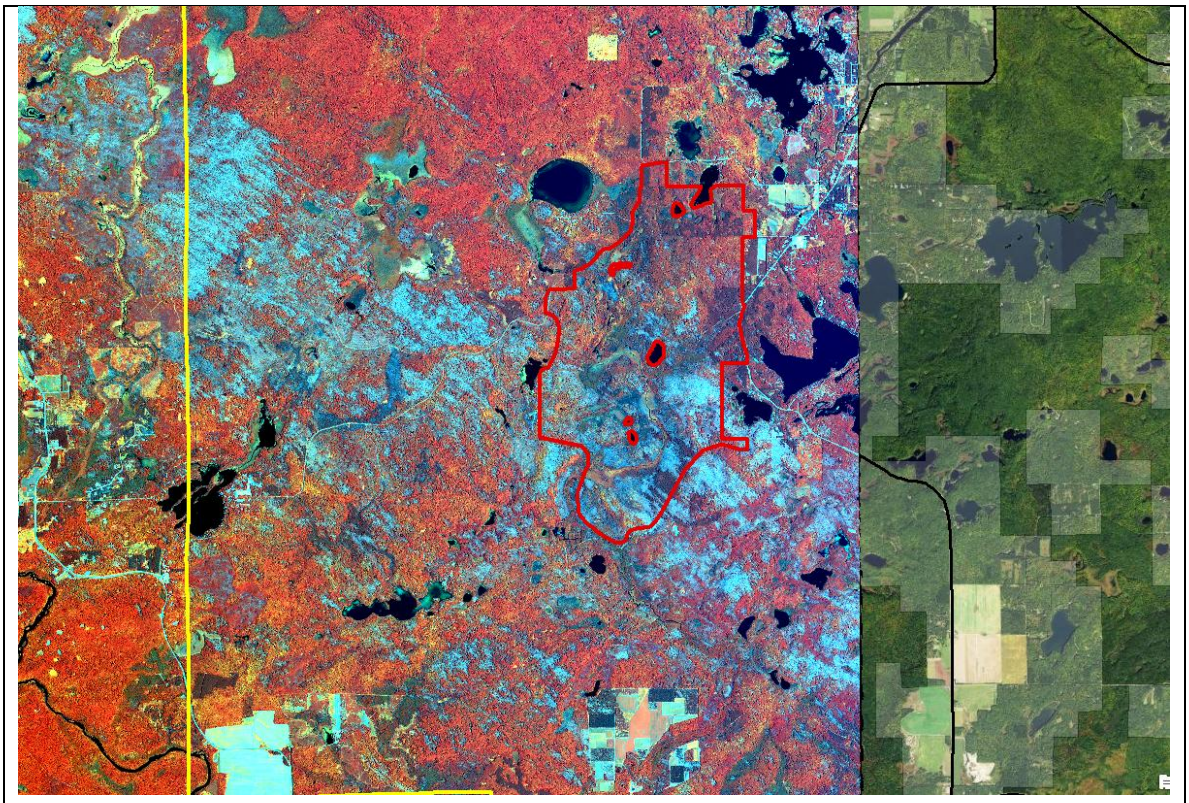

Figure 3. False color composite satellite imagery of storm damage in the southern half of the Lakewood-Laona Ranger District (National Forest lands are to the right of the yellow boundary line). The blue color are areas that are completely flattened. Ground reconnaissance has determined that many of the red areas are composed of trees that are nearly 100% bent or root sprung. The 3,200 acre Jones Springs Primitive Non-Motorized recreation area is outlined in red.

Table 1. Damaged forest summary based on aerial image interpretation and field reconnaissance

Damage category	Description & proposed treatment	Area (acres)
Light damage	Less than 25% damaged/down. No salvage*	56,100
Moderate damage	>25% to 50% down. 100% salvage	14,500
Heavy damage	>50% to 75% down. 100% salvage	3,500
Most severe	>75% to 100% down. 100% salvage	62,900
Lowland forest types	No salvage*	Included in totals above
Ecological Reference Areas	No salvage*	Included in totals above
Total		**137,000**

***** Site-specific concerns, such as danger to lives and property, pest control management, or regeneration concerns, drive the need for salvage (2004 Forest Plan Standards and Guidelines)

Proposed Action

The primary purpose of this project is:

- To reduce safety concerns posed by storm-damaged timber in areas frequented by forest users, including the transportation systems.
- To reduce fire risk to homes and other infrastructure adjacent to storm-damaged forested areas, especially within the Wildland Urban Interface.

Figure 4. Hardwood forest with downed and leaning trees. It is likely that natural regenration would be allowed to occur after the salvage harvest. Portions of the stand where damage is less than 25% would be reserved from harvest.

- To reduce fire risk to forested areas that are adjacent to storm-damaged areas.
- To capture the commercial value of storm-damaged timber, to the extent possible, so that viable timber sales can be the mechanism for reducing fuel loads and preparing acres for reforestation or other management actions. Roughly 40,000 acres of forested stand are proposed to be salvaged yielding approximately **300 Million board feet** (MMBF) of timber (Table 2)
- To reduce potential infestation and disease risk to minimally or unaffected forested areas that are adjacent to areas with substantial damage caused by the blowdown.
- To remove damaged trees to facilitate reforestation efforts.

Table 2. Proposed to salvage (does not include stands already covered with NEPA already).

Damage category	Aspen & Birch	Hardwoods & Oak	Pine
Light damage	0 acres	0 acres	62 acres
Moderate damage	3,549 acres	2,977 acres	795 acres
Heavy damage	1,549 acres	382 acres	170 acres
Most severe	14,954 acres	12,998 acres	2,561 acres
totals	**20,053 acres**	**16,356 acres**	**3,588 acres**

Commercial timber sales will be the preferred method for salvaging the downed trees; the viability of such sales likely will decrease over time as the quality of the wood decrease through summer and fall 2020. To further expedite offering these salvage sales will be valued with a standard rate appraisal per the direction set forth by the Deputy Chief, National Forest System in

his letter to Regional Foresters dated June 5, 2019. Because of the expected reduction in final sale values due to the salvage condition, Knutson-Vandenberg collections are unlikely to be sufficient to cover site-preparation and reforestation costs within conifer forest types. To expedite the salvage and reforestation in the affected area, a proportion of the timber sales will be prepared, sold and administered by Wisconsin Department of Natural Resources under the Good Neighbor Authority. Timber sale volume will be deck scaled because the sales will be using virtual boundaries; marking boundaries with paint is infeasible due to hazardous field conditions. The timber sales of this project will add to the approximately 8,400 acres (75 MMBF) that has been or will be offered for sale from other NEPA projects in the affected area (See Appendix B for more details).

USFS staff, agreement partners and contractors will complete fuel reduction treatments (mastication, chipping, piling and burning) in timber sale areas that go without bids and for damaged areas that do not have commercially viable forest products.

It remains to be seen what proportion of the storm-damaged area will go without salvage and fuel reduction treatments because of the uncertainty of which timber sales will go without bids. Regardless, the majority (58%) of the acreage affected by the blowdown would remain unsalvaged Table 3). The areas without a proposed treatment are disproportionally represented in the "light damage" category; this project focuses on the hardest hit areas. Severely damaged areas for which no salvage is proposed are concentrated in lowlands and ecological reference areas.

Table 3. Salvage Treatments (acres) proposed in this project in the context of the entire blowdown area and other salvage actions already approved in other project-level analyses.

	Light Damage	Moderate Damage	Heavy Damage	Most Severe	Total
This project	50 ac	7,300 ac	2,100 ac	30,600 ac	40,050 ac
Other vegetation management projects	7,850 ac	3,100 ac	350 ac	16,050 ac	27,350 ac
No proposed treatment	51,400 ac	4,050 ac	1,000 ac	36,300 ac	92,750 ac
totals	**59,300 ac**	**14,450 ac**	**3,450 ac**	**82,950 ac**	**160,150 ac**

Need for an Emergency Situation Determination

Based on the extensive damage from July 2019 storm and the time-sensitive components of recovery actions, the CNNF has requested an emergency situation determination (ESD) from the Chief of the Forest Service. This ESD would capture the commercial value of downed timber, reduce forest fire and tree disease risk, and provide for safety to the public in this area popular with recreationists. If granted, an ESD would waive the pre-decisional objection process, allowing expedited implementation of the proposed activities.

Forest Service regulations define an emergency situation as "a situation on National Forest System (NFS) lands for which immediate implementation of a decision is necessary to achieve one or more of the following: Relief from hazards threatening human health and safety; mitigation of threats to natural resources on NFS or adjacent lands; avoiding a loss of commodity value sufficient to jeopardize the agency's ability to accomplish project objectives directly related

to resource protection or restoration" (36 CFR 218.21(b)). All of these criteria are applicable to 2019 Blowdown Project activities on the Chequamegon-Nicolet National Forest.

Figure 5. Red pine forest along Saul Springs Road. This is an example of a stand in proposed for salvage and fuels reduction prior to reforestation actions such as planting of red/white pine.

The salvage harvest activities being proposed to meet the need for the restoration of forest health would result in the availability of wood products, including pulpwood, biomass, and saw timber. Based on past transactions, there is a demonstrated demand for these types of wood products, making commercial timber harvest the preferred tool for accomplishing vegetation treatments. Timing is critical, however, because the marketability of the forest products will depend on the quality of the wood. During the winter, insects and fungi are not accelerating the deterioration. It is the desire of the CNNF to get as much of the salvage material under contract before quality deteriorates so that the purchasers have the responsibility and opportunity to make decisions on when to harvest the wood. Some traditional timber sales on the Forest have a restricted season of operations to limit or avoid impacts to specific resources; the CNNF intends to be as flexible to the extent possible with purchasers to allow for salvage to occur year-round while the wood is commercially viable.

This area of the Lakewood-Laona Ranger district is interspersed with small, rural communities and private lands. Approximately 61,400 acres of Wildland Urban Interface (WUI) lands are within the analysis area of the storm. WUI lands are defined as areas where homes are built near or among lands prone to wildland fire. Within the WUI area there are approximately 6,730 structures that are at risk of wildfire because of the increased fuel created by the storm. Due to the increase of hazardous fuel loading, the number of structures and the potential for catastrophic wildfire, there is a need to reduce the amount of hazardous fuel within the storm affected area.

Threats to human health and safety include direct risks to CNNF employees, volunteers, partners and visitors from downed and damaged trees as well as indirect, potential risks associated with wildfire. The high density and large spatial extent of down and damaged trees is limiting the public's ability to safely access and use much of the Forest. The southern Lakewood-Laona Ranger District is very popular for camping, hiking, hunting and nature viewing, but the damaged stands make access and travel through the forest difficult and dangerous. Although most public roads have been cleared, many non-system
roads and trails used by forest visitors are still blocked by fallen trees. Standing trees with damaged roots could topple unexpectedly with wind, rain or snow.

Although an ESD could be perceived as reducing the opportunity for additional pre-decisional public engagement, the Forest sought input from stakeholders, local communities, the timber industry, and other federal and state agencies and partners. Comments received (post-event, scoping, and 30-day public engagement periods in September 2019 and January 2020) indicate support for the project as long as resources can be protected to the extent practicable. Authorizing an ESD will not bypass public involvement; instead, it would allow the Forest to implement recovery actions that meet the criteria for an emergency situation. The public is aware of the need for quick action due to experience with the Quad County Tornado on this same Ranger District in 2007.

Post-Storm Public Involvement

Public Notification: This project was listed on the Quarterly Schedule of Proposed Actions (SOPA) beginning on August 7, 2019. This schedule is mailed or emailed to dozens of individuals and is available on the World Wide Web for those people interested in proposals occurring on the Forest. The project information is available on the Forest website at http://www.fs.usda.gov/project/?project=56538.

To gather feedback on this project a mailing was sent on August 7, 2019 to 33 stakeholders/interested parties. The notification was sent to landowners in blowdown area and representatives of various townships, companies, organizations, and agencies expressing interest in information about projects on the ranger district. The Forest received three responses from the August 7, 2019 public notice of the project. One was concerned with the degree of salvage within stands and encouraged harvest prescriptions that promote adequate stocking in the regenerating stand. Two respondents were encouraged salvage harvests adjacent to their property to reduce the risk of wildfire.

A second public scoping and concurrent public comment period on the proposed action of this project was initiated on January 4, 2020 and concluded on February 4, 2020. The January 2020 public notice, web-posting and comment period disclosed that the Chequamegon-Nicolet National Forest is seeking an ESD from the Chief of the Forest Service to be able to expedite actions to salvage timber, reduce hazardous fuels and restore access across the affected area. Comments received were supportive of fuel reduction (3) and right-of-way clearing (2), supportive of aspen regeneration and reforestation (2). One commenter requested that the Forest increase open road density through this project, which is outside of the scope of this project; the project is focused on the rapid salvage of downed timber and restoring access to pre-blowdown conditions, not above that level.

Rationale for the Emergency Situation Determination

An ESD would allow reduction of threats to human safety by expediting removal of downed and standing but damaged trees before their economic value is lost. An ESD would reduce threats to both human safety and resources by allowing the removal of dead trees before they result in a hazardous accumulation of fuels. Without an ESD, a greater proportion of the downed wood would need to be removed at the expense of the federal government as opposed to being sold as a commercially-viable wood product purchased from the federal government.

By waiving the 90-day objection process (and possible 30-day extension), the CNNF can capture the value of the timber which would be lost within 12-36 months of which 5 months have already elapsed. Without an ESD, project approval may not occur until late-summer 2020 and beyond (see Table 4).

Table 42. Chequamegon-Nicolet NF Blowdown Implementation Timeline

Action	Project Timeline with an ESD	Project Timeline with an Objection Period
Wisconsin Blowdown/Tornado Storm event	July 19, 2019	July 19, 2019
Emergency road clearing, rescuing trapped campers	July 19 –November 22, 2019	July 19 – November 22, 2019
Section 106 Emergency Consultation with Wisconsin State Historic Preservation Office. A blowdown-specific Programmatic Agreement to proceed with emergency actions and resource protection actions is in development	August 1, 2019 - present	August 1, 2019 - present
Section 7 Emergency Consultation with US FWS	August 28, 2019 (Phone and email approval to proceed with actions that may impact Northern Long-eared bat; post-project monitoring/reporting will be required)	August 28, 2019 (Phone and email approval to proceed with actions that may impact Northern Long-eared bat; post-project monitoring/reporting will be required)
Began 30-Day Public Scoping of Proposed Action (8/7/2019 to 9/6/2019)	August 7,2019	August 7, 2019
Began second scoping and 30-Day Notice and Comment on Proposed Action (1/4/2020 to 2/4/2020)	January 4, 2020	January 4, 2020
Final EA prepared	February 28, 2020	February 28, 2020
Chief's Approval of ESD	On or before February 28, 2020	Not applicable
EA and draft Decision Notice; 45-day objection period begins	Not applicable	February 28, 2020
Objection Period Ends; 45-day objection review and response period begins	Not applicable	April 13th, 2020
Objection review and response period ends (*May be extended up to 30 days*)	Not applicable	June 12, 2020 (*Assumes no extension*)
Release of Signed Decision Notice (*Decision may be signed as soon as ESD is approved by the Chief or a written objection response is received from the reviewing officer*)	March 3,2020	June 26, 2020 (*May be extended if instructions are received from the reviewing officer*)
Timber Sale Advertisement (*15-day advertisement*)	March 9, 2020	July 3, 2020
Timber Sale Award	March 24, 2020	July 17, 2020
Execution of Contract - Hazard Tree Removal and Salvage Sale Operations Begin	April 6, 2020	August 3, 2020

The benefit of the estimated 4-month advantage of an ESD is best described as a shift in the likelihood of awarding a commercial timber sale versus having sales go without bids and needing to contract the debris removal before reforestation actions can occur. Fuel reduction and reforestation treatments differ by forest type groups (i.e. conifers, aspen and hardwood). Roughly, without an Emergency Situation determination (Table 5A), we can assume a 50/50 split of acres between commercial timber sales and fuel reduction contracts while with an ESD (Table

5B) , we may expect a sale success rate closer to 80%. This difference in success rate would make more than a $6 million difference given these estimated cost and revenue rates.

There may be opportunities, through the packaging of timber sales to balance salvage in stands with relatively expensive fuel and reforestation costs (conifer stands) with salvage in aspen and hardwood stands where such secondary treatments are not needed or are less costly. By doing so, the likelihood of sale may be increased and the costs may be more advantageously distributed among possible funding sources for these actions.

Table 5A. Cost estimate of the project without an ESD; it is assumed that 50% of the sales offered go without bids and must be shifted to fuel reduction contracts before reforestation actions are implemented

Forest Type Grouping	Acres	Timber Sale receipts per acre	Fuel treatment cost per acres	Site Prep and Reforestation cost per acre	Cost of Project
Conifer	2,150	+144	-500	-367	$ (1,554,450)
Conifer No Bid	2,150	0	-1000	-367	$ (2,939,050)
Aspen	7,850	+144	0	-32	$ 879,200
Aspen No Bid	7,850	0	-400	-32	$ (3,391,200)
Hardwoods	8,700	+144	0	-32	$ 974,400
Hardwoods No Bid	8,700	0	-400	-32	$ (3,758,400)
TOTAL	37,400			TOTAL COST	$ (9,789,500)

Table 5B. Cost estimate of the project with an ESD; it is assumed that 20% of the sales offered go without bids and must be shifted to fuel reduction contracts before reforestation actions are implemented

Forest Type Grouping	Acres	Timber Sale receipts per acre	Fuel treatment cost per acres	Site Prep and Reforestation cost per acre	Cost of Project
Conifer	3,440	+144	-500	-367	$ (2,487,120)
Conifer No Bid	860	0	-1000	-367	$ (1,175,620)
Aspen	12,560	+144	0	-32	$ 1,406,720
Aspen No Bid	3,140	0	-400	-32	$ (1,356,480)
Hardwoods	13,920	+144	0	-32	$ 1,559,040
Hardwoods No Bid	3,480	0	-400	-32	$ (1,503,360)
TOTAL	37,400			TOTAL COST	$ (3,556,820)

Consultation with United States Fish and Wildlife Service and Wisconsin State Historical Preservation Office (SHPO)

More detailed analysis, effects determinations and descriptions of consultation procedures for ESA listed species and heritage resources can be found in the environmental assessment or the project record.

US Fish and Wildlife Service (FWS)

Section 7 consultation with the FWS began on August 26, 2019. Though several Federally-listed species are known from the Chequamegon-Nicolet National Forest, only the Grey Wolf and Northern Long-eared Bat (NLEB) are likely to be present in the blowdown area. For Grey Wolf, no impacts of the action are anticipated from the project. Northern Long-eared Bat individuals and summer roosting habitat may be impacted by this project. To meet FWS expectations in consultation, the Forest will continue to use streamlined 4(d) consultation for NLEB including estimates of the area (acres) where standing trees are expected to be lost to salvage operations as well as corresponding maps of those actions.

Wisconsin State Historical Preservation Office (SHPO)

Before this windstorm event, the Chequamegon-Nicolet National Forest did not have in place a Programmatic Agreement (PA) that addressed this type of situation with the Wisconsin State Historic Preservation Office (SHPO). As a result of this windstorm event, the Forest and the SHPO are working on a PA to outline the emergency approach to natural disturbance events establishing a good faith effort to identify and protect significant cultural resources within impacted areas while considering safety concerns.

The PA will provide alternatives to standard Section 106 field investigations as well as establish expedited timeframes following a significant weather event such as this blowdown. Consultation on the specific weather event and the alternative Section 106 process will occur with the SHPO and consulting Tribes prior to salvage operations. The PA will meet the Forest's responsibilities under the National Historic Preservation Act rather than following the procedures set forth in 36 CFR 800.3 through 800.7.

Summary

The CNNF requests an ESD to accelerate the removal of excessive fuels that have resulted from the wind storm on approximately 137,000 acres. There is a need to restore forest health and reduce fuel loading in areas that were damaged by this extensive wind storm within the next year. If left untreated, the wood may not be commercially viable. Dead and down trees that persist for several years would also increase the potential for a forest pest infestations that could damage additional unaffected areas. The volume of down and damaged trees is limiting the public's ability to safely access and use this popular area of the Forest. The damaged stands not only make access and travel through the forest difficult, but also pose a health and safety risk for the many hikers, hunters and anglers who use the forest.

Currently, there is a market for downed trees (salvage), which would expedite the removal process. If commercial timber harvests cease to be viable in the blowdown area because of the deterioration of the wood, the Chequamegon-Nicolet National Forest will shift focus to fuels

reduction projects to reduce wildfire risk and restore productive forest conditions. This second phase of blowdown response will be costly.

To facilitate an efficient recovery effort in terms of NEPA and planning, the Forest has already completed Reviews of New Information and additional analyses for four vegetation management projects (3 EA's and 1 EIS) to allow for revised timber harvest prescriptions. Additional Categorical Exclusions have been used or are in preparation to expedite NEPA for blowdown response actions. This present ESD request is intended to cover the affected area for which existing NEPA and *in progress* Categorically Excluded actions do not apply.

Emergency consultation and a plan for follow-up monitoring/reporting is in place with the FWS. The Forest's Heritage Program Manager is developing a Programmatic Agreement with the Wisconsin State Historic Preservation Office for the protection of known pre-historic and historic sites as well as post-emergency response monitoring and conservation of these resources.

Without an ESD, options for implementing salvage operations before the downed trees are a safety and wildfire risk and before the wood has no value are reduced. In northern Wisconsin, the spring thaw results in a period of time (March through mid-April) during which there are weight limits on Forest roads. Logging equipment and log trucks will be operating throughout winter 2019-2020 on downed timber that has been cleared through NEPA so far, and will largely cease for the spring break-up period and because no more salvage opportunities have completed NEPA. If this ESD is approved, and additional timber salvage and fuel reduction actions have been cleared with this EA, operations will be able to resume once weight limits are lifted. Without the ESD, the objection period would consume more than a month of the season of field operations.

A combined scoping and 30-day notice and comment period was initiated on January 4, 2020. Comments received during the August 2019 scoping period and the second scoping and public comment period in January 2020 have been considered. Overall, the public engagement that has occurred with stakeholders, the community and its leaders, the timber industry, and other federal and state agencies and partners indicates support for implementing salvage and restoration efforts.

Literature Cited

Anderson, A. 2019. Salvaging Storm-Damaged Forest Products. Wisconsin Department of Natural Resources; unpublished report by Alex Anderson, forest products specialist, Rhinelander, WI. 3pp.

Bratkovitch, S., B. McNee, and J.F. Kyhl. 2010. Marketing dead timber in the upper Midwest. USDA-FS, Northeastern Area State and Private Forestry NA-IA-02-10.

WDNR. 2019. Storm damage to forests. Website: https://dnr.wi.gov/topic/forestlandowners/stormrecovery.html [last updated: 2019-OCT-24; last accessed: 2019-DEC-06].

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Appendix A. Salvage Actions Decision Tree

Stand is located in Management Area 1, 2, 3, 4, or 6. **If yes, go to 1**. **If no, go to 2**.

1. Management Area 1, 2, 3, 4, or 6.

    a. Management Area 1-4 or 6B. **Go to 3**.

    b. Management Area 6A. Normally, timber harvest isn't allowed in this MA. However, it is allowed if timber harvest is needed for public protection, pest control management, or to create desired conditions for tree regeneration following catastrophic events such as wind (LRMP p. 3-31). **If this applies, go to 3**. **If this does not apply, no salvage would take place**.

2. Other than Management Area 1, 2, 3, 4, or 6.

    a. Management Area 8E- Research Natural Area. Salvage operations would not be permitted unless there is a specific threat to lives and adjacent property. If it is determined that this is the case and action is desired, **go to 3**. **If this does not apply, no salvage would take place**.

    b. Management Area 8F or 8G-Special Management or Old Growth Areas. Ordinarily, salvage would not be permitted in these areas, except if there is a threat to human life, adjacent private property, or the area no longer retains the characteristics for which it was designed. If it is determined that this is the case and action is desired, **go to 3**.

3. Greater than 25% of the stand is damaged. **Go to 5**.

4. Less than 25% of the stand is damaged. In most cases, salvage will not occur. However, if site-specific concerns, such as danger to lives and property, pest control management, or regeneration concerns, drive the need for salvage, **go to 5**.

5. Is the stand located in a lowland forest type group? **If yes, salvage would not normally be allowed**. However, if site-specific concerns, such as danger to lives and property, pest control management, or regeneration concerns, drive the need for salvage, go to 6. **If no, go to 6.**

6. Is the stand in a land suitability class (LSC) that is suitable for timber production (LSC 500)? **If no, use the following decision tree. If yes, go to 7**.

    a. LSC= 300- Withdrawn lands. Normally salvage would not be permitted. However, if it is determined that action is needed to protect lives and property, go to 7.

    b. LSC=710- Physically unsuitable, cannot be restocked within 5 years. Normally, timber harvest is not allowed in these areas. However, if salvage is desired to for public protection, pest control management, or to create desired conditions for tree regeneration, go to 7.

    c. LSC=720- Physically unsuitable, irreversible damage would occur if harvested. Salvage harvest would not be allowed unless it is needed to protect lives and property. If this is deemed necessary, go to 7.

d. LSC=801- Resource protection required for threatened, endangered, or sensitive species. Normally, salvage would not be permitted in these areas. However, if the area no longer retains the characteristics that require protection or if salvage is determined necessary to protect lives and property, go to 7.

e. LSC=810-Timber production excluded or restricted due to developed uses (such as campgrounds, etc..). Normally, timber harvest isn't permitted in these areas. However, if salvage is desirable to clean up/protect the property in question, then go to 7.

f. LSC=820-areas not cost-efficient for meeting forest objectives. Normally, harvest is excluded from these areas. However, if the area in question is heavily damaged and salvage is desirable, go to 7.

g. LSC=840- areas if low site index. In most cases, these will be lowland areas that would already be excluded from harvest. However, if damage is severe and poses a threat to lives or property, then salvage may be allowed. If this is the case, go to 7.

7. Is the forest type group aspen? If yes, use the following decision tree. If no, go to 8.

    a. Is the stand merchantable? If yes, continue on to 7b. If no, and it is heavily damaged, consider precommercial shearing or some other regeneration method.

    b. Damage >25% and composition objective is aspen? If yes, regenerate with clearcut method. If no, continue to 7c.

    c. Damage >25% and composition objective is conversion to other types. If yes, salvage broken, bent, leaning, and down trees while retaining remaining wind-firm trees. If no, continue to 7d.

    d. Damage<25%. In most cases, these areas will not be salvaged. However, if site-specific reasons call for salvage (such as protection of life, property, and other values), continue to 7e.

    e. Is aspen regeneration desired? If yes, regenerate with the clearcut method. If no, continue to 7f.

    f. Salvage broken, bent, leaning, and downed trees while retaining remaining wind-firm trees.

8. Is the forest type group balsam fir? If yes, use the following decision tree. If no, go to 9

    a. Is the stand merchantable? If yes, continue on to 8b. If no, and it is heavily damaged and adjacent to private property, consider mastication or some other form of slash disposal to reduce fuel hazards.

    b. Damage >25% and composition objective is balsam fir? If yes, regenerate with the clearcut, seed tree, or shelterwood method. If no, continue to 8c.

    c. Damage >25% and composition objective is conversion to other types. If yes, salvage broken, bent, leaning, and down trees while retaining remaining wind-firm trees. If no, continue to 8d.

d. Damage<25%. In most cases, these areas will not be salvaged. However, if site-specific reasons call for salvage (such as protection of life, property, and other values), continue to 8e.

e. Is balsam fir regeneration desired? If yes, regenerate with the clearcut, seed tree, or shelterwood methods. If no, continue to 8f.

f. Depending on the target species desired, the harvest treatment could range from a clearcut, site preparation, and full plant to a limited thinning to promote natural seeding of shade-tolerant species. Follow site-specific conditions to determine the appropriate prescription for conversion.

9. Is the forest type group northern hardwood? If yes, use the following decision tree. If no, go to 10.

    a. Is the stand merchantable? If yes, continue on to 9b. If no, and it is heavily damaged and adjacent to private property, consider mastication or some other form of slash disposal to reduce fuel hazards.

    b. Damage >25% and composition objective is northern hardwoods? If yes, salvage broken, bent, leaning, and down trees while retaining remaining wind-firm trees. If no, continue to 9c.

    c. Damage >25% and composition objective is conversion to other types. If yes, first, ensure that sufficient seed trees/coppice trees exist. If they do not, consider suitability for other species, such as pine. If there are at least 20 ft^2/acre of well-distributed aspen, consider commercial clearcut to regenerate aspen. If the site has a hardwood site index of <55 consider natural or artificial regeneration methods to pine, oak, or birch. If this doesn't apply, continue to 9d.

    d. Damage<25%. In most cases, these areas will not be salvaged. However, if site-specific reasons call for salvage (such as protection of life, property, and other values), continue to 9e.

    e. Is northern hardwood composition desired? If yes, salvage broken, bent, leaning, and down trees while retaining remaining wind-firm trees. This would emulate a shelterwood harvest. If no, continue to 9f.

    f. Depending on the target species desired, the harvest treatment could range from a clearcut, site preparation, and full plant to a limited thinning to promote natural seeding of shade-tolerant species. Follow site-specific conditions to determine the appropriate prescription for conversion.

10. Is the forest type group white pine? If yes, use the following decision tree. If no, go to 11.

    a. Is the stand merchantable? If yes, continue on to 10b. If no, and it is heavily damaged and adjacent to private property, consider mastication or some other form of slash disposal to reduce fuel hazards.

    b. Damage >25% and composition objective is white pine? If yes, salvage broken, bent, leaning, and down trees while retaining remaining wind-firm trees as a seed

source. Consider ground scarification to prepare a seed bed. If white pine is not the objective, continue to 10c.

c. Damage >25% and composition objective is conversion to other types. If yes, assess available seed sources and coppice trees. If there are at least 20 ft^2/acre of well-distributed aspen, consider commercial clearcut to regenerate aspen. If the site has a hardwood site index of <55 consider natural or artificial regeneration methods to oak, or birch. If the site has a hardwood site index of >55%, look for opportunities to convert to northern hardwoods using a shelterwood-type treatment. If this doesn't apply, continue to 10d.

d. Damage<25%. In most cases, these areas will not be salvaged. However, if site-specific reasons call for salvage (such as protection of life, property, and other values), continue to 10e.

e. Is white pine composition desired? If yes, salvage broken, bent, leaning, and down trees while retaining remaining wind-firm trees. This would emulate a shelterwood harvest. If no, continue to 10f.

f. Depending on the target species desired, the harvest treatment could range from a clearcut, site preparation, and full plant to a limited thinning to promote natural seeding of mid-tolerant or shade-tolerant species. Follow site-specific conditions to determine the appropriate prescription for conversion.

11. Is the forest type group red pine? If yes, use the following decision tree. If no, go to 12.

a. Is the stand merchantable? If yes, continue on to 11b. If no, and it is heavily damaged and adjacent to private property, consider mastication or some other form of slash disposal to reduce fuel hazards.

b. Damage >25% and composition objective is red pine? If yes, salvage clearcut the stand, mechanically site prepare the site, and plant to red pine. If red pine is not the objective, continue to 11c.

c. Damage >25% and composition objective is conversion to other types. If yes, assess available seed sources and coppice trees. If there are at least 20 ft^2/acre of well-distributed aspen, consider commercial clearcut to regenerate aspen. If the site has a hardwood site index of <55 consider natural or artificial regeneration methods to oak, birch, or upland conifer species. If the site has a hardwood site index of >55%, look for opportunities to convert to northern hardwoods using a shelterwood-type treatment. If this doesn't apply, continue to 11d.

d. Damage<25%. In most cases, these areas will not be salvaged. However, if site-specific reasons call for salvage (such as protection of life, property, and other values), continue to 11e.

e. Is red pine composition desired? If yes, salvage broken, bent, leaning, and down trees while retaining remaining wind-firm trees. This should maintain a red pine type. If no, continue to 11f.

f. Depending on the target species desired, the harvest treatment could range from a clearcut, site preparation, and full plant to a limited thinning to promote natural

seeding of mid-tolerant or shade-tolerant species. Follow site-specific conditions to determine the appropriate prescription for conversion.

12. Is the forest type group upland spruce? If yes, use the following decision tree. If no, go to 13.

    a. Is the stand merchantable? If yes, continue on to 12b. If no, and it is heavily damaged and adjacent to private property, consider mastication or some other form of slash disposal to reduce fuel hazards.

    b. Damage >25% and composition objective is spruce? If yes, salvage clearcut the stand, mechanically site prepare the site, and plant to spruce. If spruce is not the objective, continue to 12c.

    c. Damage >25% and composition objective is conversion to other types. If yes, assess available seed sources and coppice trees. If there are at least 20 ft^2/acre of well-distributed aspen, consider commercial clearcut to regenerate aspen. If the site has a hardwood site index of <55 consider natural or artificial regeneration methods to oak, birch, or upland conifer species. If the site has a hardwood site index of >55%, look for opportunities to convert to northern hardwoods using a shelterwood-type treatment. If this doesn't apply, continue to 12d.

    d. Damage<25%. In most cases, these areas will not be salvaged. However, if site-specific reasons call for salvage (such as protection of life, property, and other values), continue to 12e.

    e. Is spruce composition desired? If yes, salvage broken, bent, leaning, and down trees while retaining remaining wind-firm trees. This should maintain a spruce type. If no, continue to 12f.

    f. Depending on the target species desired, the harvest treatment could range from a clearcut, site preparation, and full plant to a limited thinning to promote natural seeding of mid-tolerant or shade-tolerant species. Follow site-specific conditions to determine the appropriate prescription for conversion.

13. Is the forest type group jack pine? If yes, use the following decision tree. If no, go to 14.

    a. Is the stand merchantable? If yes, continue on to 13b. If no, and it is heavily damaged and adjacent to private property, consider mastication or some other form of slash disposal to reduce fuel hazards.

    b. Damage >25% and composition objective is jack pine? If yes, salvage clearcut the stand, mechanically site prepare the site, and plant or seed to red pine. If jack pine is not the objective, continue to 13c.

    c. Damage >25% and composition objective is conversion to other types. If yes, assess available seed sources and coppice trees. If there are at least 20 ft^2/acre of well-distributed aspen, consider commercial clearcut to regenerate aspen. If oak is present on the site, retain as much as possible as a seed source. If birch is present, mechanically scarify and retain paper birch as seed trees. If this doesn't apply, continue to 13d.

d. Damage<25%. In most cases, these areas will not be salvaged. However, if site-specific reasons call for salvage (such as protection of life, property, and other values), continue to 13e.

e. Is jack pine composition desired? If yes, either clearcut and replant or clearcut, scarify, and regenerate with seed tree regeneration method. If no, continue to 13f.

f. Depending on the target species desired, the harvest treatment could range from a clearcut, site preparation, and full plant to a limited thinning to promote natural seeding of mid-tolerant or shade-tolerant species. Follow site-specific conditions to determine the appropriate prescription for conversion.

14. Is the forest type group hemlock? If yes, use the following decision tree. If no, go to 15.

    a. Is the stand merchantable? If yes, continue on to 14b. If no, and it is heavily damaged and adjacent to private property, consider mastication or some other form of slash disposal to reduce fuel hazards.

    b. Damage >25% and composition objective is hemlock? If yes, salvage clearcut the stand, mechanically site prepare the site, and plant or naturally seed to hemlock. If hemlock is not the objective, continue to 14c.

    c. Damage >25% and composition objective is conversion to other types. If yes, assess available seed sources and coppice trees. If there are at least 20 ft^2/acre of well-distributed aspen, consider commercial clearcut to regenerate aspen. If the site has a hardwood site index of <55 consider natural or artificial regeneration methods to oak, birch, or upland conifer species. If the site has a hardwood site index of >55, look for opportunities to convert to northern hardwoods using a shelterwood-type treatment. If this doesn't apply, continue to 14d.

    d. Damage<25%. In most cases, these areas will not be salvaged. However, if site-specific reasons call for salvage (such as protection of life, property, and other values), continue to 14e.

    e. Is hemlock composition desired? If yes, salvage broken, bent, leaning, and down trees while retaining remaining wind-firm trees. Where possible, follow this treatment with mechanical site preparation. This should maintain a hemlock type and promote additional hemlock regeneration. If no, continue to 14f.

    f. Depending on the target species desired, the harvest treatment could range from a clearcut, site preparation, and full plant to a limited thinning to promote natural seeding of mid-tolerant or shade-tolerant species. Follow site-specific conditions to determine the appropriate prescription for conversion.

15. Is the forest type group paper birch? If yes, use the following decision tree. If no, go to 16.

    a. Is the stand merchantable? If yes, continue on to 15b. If no, and it is heavily damaged and adjacent to private property, consider mastication or some other form of slash disposal to reduce fuel hazards.

b. Damage >25% and composition objective is paper birch? If yes, salvage the stand to leave 25-50% crown closure of predominantly birch trees and mechanically site prepare the site. If paper birch is not the objective, continue to 15c.

c. Damage >25% and composition objective is conversion to other types. If yes, assess available seed sources and coppice trees. If there are at least 20 ft^2/acre of well-distributed aspen, consider commercial clearcut to regenerate aspen. If the site has a hardwood site index of <55 consider natural or artificial regeneration methods to oak, birch, or upland conifer species. If the site has a hardwood site index of >55%, look for opportunities to convert to northern hardwoods using a shelterwood-type treatment. If this doesn't apply, continue to 15d.

d. Damage<25%. In most cases, these areas will not be salvaged. However, if site-specific reasons call for salvage (such as protection of life, property, and other values), continue to 14e.

e. Is paper birch composition desired? If yes, salvage broken, bent, leaning, and down trees while retaining remaining wind-firm paper birch trees. Reduce overall stocking to approximately 40-50% crown closure of birch. Where possible, follow this treatment with mechanical site preparation. This will be conducive to paper birch regeneration. If no, continue to 15f.

f. Depending on the target species desired, the harvest treatment could range from a clearcut, site preparation, and full plant to a limited thinning to promote natural seeding of mid-tolerant or shade-tolerant species. Follow site-specific conditions to determine the appropriate prescription for conversion.

16. Is the forest type group oak? If yes, use the following decision tree. If no, go to 17.

a. Is the stand merchantable? If yes, continue on to 16b. If no, and it is heavily damaged and adjacent to private property, consider mastication or some other form of slash disposal to reduce fuel hazards.

b. Damage >25% and composition objective is oak? If yes, continue to 16c. If no, go to 16d.

c. If the oak site index is <65, harvest all other species and all damaged oak, treating the stand as an oak shelterwood/seed tree. Follow with mechanical site preparation to scarify the soil. Seed regeneration and stump sprouting should result. If the oak site index is $\geq$65, harvest all damaged oak and additional trees to result in approximately 40-50% crown closure. Scarify the site to encourage seed regeneration.

d. Damage >25% and composition objective is conversion to other types. If yes, assess available seed sources and coppice trees. If there are at least 20 ft^2/acre of well-distributed aspen, consider commercial clearcut to regenerate aspen. If the site has a oak site index of <65 consider natural or artificial regeneration methods to birch or red pine. If the site has a oak site index of $\geq$65, look for opportunities to convert to northern hardwoods using a shelterwood-type treatment. If this doesn't apply, continue to 16e.

e. Damage<25%. In most cases, these areas will not be salvaged. However, if site-specific reasons call for salvage (such as protection of life, property, and other values), continue to 16f.

f. Is oak composition desired? If yes, salvage broken, bent, leaning, and down trees while retaining remaining wind-firm trees. This should maintain an oak type and may promote some additional oak regeneration. If no, continue to 16g.

g. Depending on the target species desired, the harvest treatment could range from a clearcut, site preparation, and full plant to a limited thinning to promote natural seeding of mid-tolerant or shade-tolerant species. Follow site-specific conditions to determine the appropriate prescription for conversion.

17. Is the forest type group lowland conifer? If yes, use the following decision tree. If no, go to 18.

    a. Is the stand merchantable? If yes, continue on to 17b. If no, go to 17d.

    b. Ordinarily, salvage harvest will not be conducted in lowland conifers unless it is necessary to protect life and property or to address critical forest health concerns. If salvage is desired to address one of these concerns, go to 17c.

    c. Damage >50% and composition objective is lowland conifer? If black spruce site index is >25, salvage clearcut the stand during frozen ground conditions and replant the site with black spruce, tamarack, and other lowland conifer species. If black spruce site index is <25, salvage the stand and do not restock.

    d. If the stand is not merchantable, damage is heavy, and mechanical treatment is desired to address hazardous fuels or other concerns, treat the site with other means, such as mastication on frozen ground. Otherwise, allow the site to recover naturally.

18. Is the forest type group lowland hardwood? If yes, use the following decision tree.

    a. Is the stand merchantable? If yes, continue on to 18b. If no, go to 18d.

    b. Ordinarily, salvage harvest will not be conducted in lowland hardwoods unless it is necessary to protect life and property or to address critical forest health concerns. If salvage is desired to address one of these concerns, go to 18c.

    c. Damage >50% and composition objective is lowland hardwood? If black spruce site index is >25, salvage damaged trees within the stand during frozen ground conditions to address the hazard. Do not remove undamaged trees to lessen the chances of "swamping". Should regeneration be necessary, natural regeneration should be the preferred method. Otherwise, fill-in plant the site with species such as red and silver maple, balsam poplar, or other non-ash lowland hardwood species.

    d. If the stand is not merchantable, damage is heavy, and mechanical treatment is desired to address hazardous fuels or other concerns, treat the site during frozen ground conditions with other means, such as mastication or hand cutting and piling. Otherwise, allow the site to recover naturally.

Appendix B. 2019 Blowdown-related Timber Sales

Active Sales (Sold prior to the windstorm and affected by the storm)

- Ten 2400-6T timber sale contracts were modified to adjust volumes and add salvage material (totaling approximately 9.2 MMBF)
- One contract was completed and the purchaser opted not to enter into a modification.
- One contract was near completion and the addition was minor—was done through additional volume.
- One sale had minor damage and no modification was entered.

Small Business Administration Timber Sale Program

- Six contracts were SBA-set aside sales
- Discussions with SBA resulted in waiving CT8.37—Requirements for Small Business Processing

Road Clearing

- Six Integrated Resources Timber contracts were modified to add a stewardship project to clear roads. The project was paid by the hour due to high variability of obstructions
- Road miles cleared: 43.3 miles
- Minor amounts of included timber were added to a few of the contracts.

New Sales Twenty-four salvage sales have been offered as of mid-January 2020. They total 44.9 MMBF (72,719 ccf offered). As of January 10, 2020, 30.5 MMBF (49,368 ccf) had been awarded

Scaled Sales

- Utilizing variance on cruising methods for volume estimate
- Utilizing digital boundaries
- Utilizing deck scale for payment determinations

Contract Term Addition /Urgent Removal Extension

- Contract Term Adjustment. Additional time (up to 1 year) given on "green" sales to allow operations on qualifying salvage sales. This applied to timber sales on the Chequamegon-Nicolet National Forest and Ottawa National Forest
- Urgent Removal Extension. Additional time (up to 1 year) given to allow operations on salvage sales resulting from July 2019 event on other ownerships as well as sales on the Chequamegon-Nicolet National Forest and Ottawa National Forest

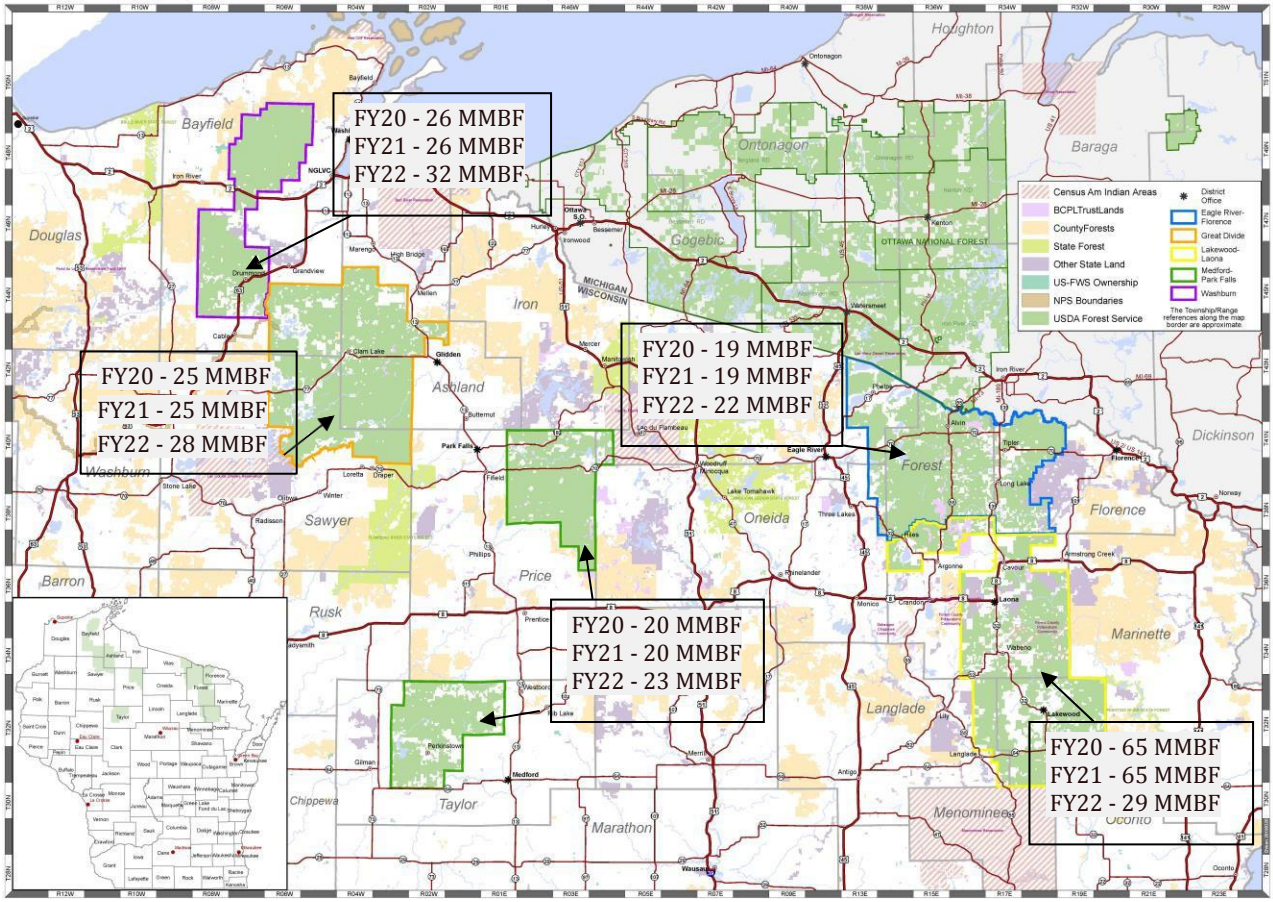

Figure B1. Estimated volume awarded in Ranger Districts during Fiscal Years 20, 21 and 22. Includes Forest Service and Good Neighbor Authority planned volume. Fy20 and FY 21 volume from Lakewood/Laona Ranger District anticipated to be 100 % salvage.